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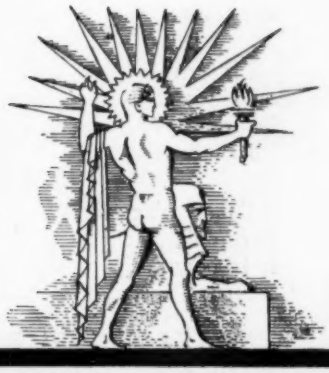
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



April 18, 1942

Distant View

See Page 243

A SCIENCE SERVICE PUBLICATION

Do You Know?

The *dolphin* is one of the fastest swimmers—its favorite food is flying fish.

The *paint* on the hull of a 10,000 ton cruiser may weigh as much as 100 tons.

Elephants had become the mounts of royalty in India long before the horse was known there.

Basic ration of *sugar* in England during the last year has been half a pound per week per person.

Cakes of salt were once used as *money* in Tibet and Abyssinia, while Mexicans once used cakes of soap.

In Norfolk, England, *toothache* was once believed caused by love, and sufferers got little sympathy.

Meat can be kept free from mold by storing it in iceboxes having carbon dioxide added to the atmosphere.

A single *house fly*, if all of its descendants lived and bred, would be the ancestor of 2,000,000 flies at the end of one summer.

Modern *dehydrating* machinery dries all kinds of fruits, milk and other foods in thin layers for shipping in condensed storage space.

Every cubic mile of ocean is estimated to contain 4,000,000 tons of *magnesium;* it is now believed the most promising source of this metal for the United States.

One *washing machine* contains enough steel to make three machine guns.

More than 300 Washington, D. C. *taxicabs* have been selected to serve as ambulances during blackouts.

More than 16,000 persons were killed at railway *grade crossings* in the past 10 years.

The United States today owns nearly three-quarters of all above-ground *gold* on the globe; about $22,700,000,000 worth.

The white *cliffs of Dover* are chalk rock composed of myriads of tiny shells of microscopic sea creatures that lived on the ocean floor ages ago.

Asparagus has been in cultivation for more than 2,000 years.

One *auto* contains enough tin to coat 1,000 cans of food for soldiers.

The *Galapagos tortoise* travels at the rate of about four miles a day.

Hot springs are generally found in the vicinity of active volcanoes, or in mountains formed by volcanic activity.

Normally the *liver* contains from 1% to 5% of fat, but in a diseased condition it may reach 30%.

Due to shortage of North African briar, American rhododendron and laurel roots are being dug for use as pipe bowls.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article*

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SCIENCE NEWS LETTER

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PHOTOGRAPHY

Color Photographs at Six Miles Soon To Be Possible

Army Air Corps Photographic Experts Already Getting Good Color Reproduction From 15,000 Foot Altitudes

See Front Cover

THE EYES of the Army—aerial photographs — are seeing the enemy in this war with new color vision, it is revealed by an announcement of the Army Air Corps at Wright Field.

No longer can enemy territory hide behind camouflage to which the ordinary black and white photographic print is blind. Brilliant color photographs have been obtained by the Air Corps from altitudes of 12,000 to 15,000 feet and it is expected by photographic experts that within the next few months color photographs can be made from airplanes flying five or six miles above the earth.

The color film that gives such beautiful and lifelike results in your amateur movie or still camera will not do at all for color work at such long range, Wright Field laboratory technicians discovered. Haze, which Army photographers have learned to "see through" with infrared-sensitive film for black and white photographs, becomes a new bugaboo to the color photographer. Colors at such a distance register as muddy and unbalanced.

The problem is being solved with the use of a three-lens camera with matched lenses and various combinations of films and filters which vary from day to day with weather conditions.

Great strips of felt 50 feet long and dyed in tested brilliant colors are stretched out on the flying field at Wright Field to aid in the photographic experiments. Next comes a sort of trial-and-error method of attack on the problem. Various film and filter combinations are tried until the colors are reproduced correctly at the desired altitudes.

Color photography is even possible at night with the aid of brilliant flash bombs of colored light—color of light and film being carefully balanced as the result of test and experiment. These flashes are so bright that they can be seen for 200 miles. Photoelectric shutter trippers insure that the picture is taken at the peak intensity of the flash. Meanwhile the night-photography plane is hidden from the enemy by darkness and high altitude.

Another new weapon of the Army Air Forces is a photo-mapping camera developed at Wright Field which makes possible new feats in fast searching out of enemy territory.

With this new camera, now going into mass production, Wright Field camera technicians recently map-photographed an area of 1,600 square miles from an altitude of 25,000 feet and were back on the ground within three hours, 35 minutes. Tiny details are clear and sharp. Five photographs, covering strips of land 50 miles long were made. Each photograph on a strip was overlapped 60% on the preceding one and each strip overlapped the preceding one 30%.

Ten years ago, a similar achievement would have taken long days of flying at a 15,000-foot altitude.

Good infrared photographs can now be made at 1/50 of a second. The picture on the front cover was made at 20,000 feet.

Science News Letter, April 18, 1942

PUBLIC HEALTH

Polio Spread by Humans, Study of Epidemic Suggests

EVIDENCE that infantile paralysis may be spread from neighborhood to neighborhood and from person to person by human travel is presented by Dr. Albert E. Casey of the Louisiana State University School of Medicine (*Science*, April 3).

Dr. Casey observed an epidemic of polio in Walker County, Ala., a mountainous mining region, with 65,000 inhabitants. The epidemic began in the last week in June, reached a peak early in August, and was virtually ended by the last week in September, 1941.

Of 101 cases interviewed, not one had been isolated during the month preceding the illness, and visits were made freely among neighbors and relatives.

FROM SIX MILES UP

A Wright Field aerial photographer pointed his 40-inch telephoto camera out of a bomber and produced a negative from which this section was enlarged. Notice how clear the details show up at this immense distance.

Eighty per cent of the infantile paralysis victims had probably been visited by a prior victim who at the time of the visit was about to become sick.

While the paralysis germ was found in the bodies of flies trapped in the neighborhood, Dr. Casey concludes from the spread of the cases that the flies were not guilty.

(There has been considerable evidence reported that insects may be a factor in spreading infantile paralysis.)

Dr. Casey concluded that a child within three days before or three days after the first symptoms was the effective means of spreading the disease in the cases he observed.

How the disease was spread from one person to another was not learned.

Science News Letter, April 18, 1942

PHYSIOLOGY—PSYCHOLOGY

Island of Tissue In Brain Controls the Water Balance

Tiny Isolated Blob of Tissue Able To Maintain Life Even When 95% of Brain Is Missing, Scientist Finds

DISCOVERY of a life-saving island of tissue that will allow life to continue even when 95% of the brain is missing, is stirring scientists to expect important new medical discoveries leading to conquest of diseases now baffling medical skill.

Just a tiny isolated blob of tissue, located in the brain and consisting of pituitary gland and hypothalamus, has been found by Drs. Martin B. Macht and Philip Bard of the Johns Hopkins University Medical School, to be responsible for maintaining the water and sugar balance in the body. Diabetes, and possibly epilepsy, are among the ills that may be found due partly to improper functioning of these structures.

New knowledge that may aid in treating war-damaged heads, and patients with brain tumors, was the first practical result of this discovery of the body's island defense.

Walking, climbing, swallowing, shivering and even responding to a whistle, which scientists have thought were controlled by various parts of the brain, can go on without the aid of those brain areas, Drs. Macht and Bard have found.

The reason a cat can right herself and land on her feet is not because of what we usually think of as her brain, but because of part of the "brain stem"—a much more primitive part of the nervous system at the base of the brain. She can turn over in response to a whistle even when she cannot "hear" it through the higher centers of the brain.

An almost completely brainless cat, with 95% of her brain missing, can walk although her gait is not all that might be desired in grace. She can climb and hop and claw, although she seems to do the latter aimlessly and without effectiveness. She can't bite.

She loses the ability to maintain a normal body temperature regardless of surrounding heat or cold. When she is cold, she shivers, but the shivering is fragmentary as compared with that of a normal cat. The shivering is not "useful" as physiologists have contended it might be—her loss of warmth is not stopped by it or even slowed.

When choice bits of liver are put into her mouth, she will gulp them down almost without any chewing, but she licks her chops—a reflex which in this case presumably does not indicate enjoyment. She swallows water, too. But left to herself she would never eat and she does not reject food when her stomach is full.

Animals with just a few hundredths of an inch more of the brain stem left intact, do know when they have had enough. They can bite. They can walk more normally.

Importance of preserving even such tiny amounts of brain tissue is one of the implications of significance to brain surgeons.

Perhaps the most important thing to scientists in this research is the development of a technique by which the localization and analysis of certain nervous system functions can be accomplished.

Science News Letter, April 18, 1942

WAR TRAINING

At a Binghamton, N. Y., high school in a laboratory designed by the General Electric Company, students are learning technical electricity. This group is using portable capacitor and electrical indicating instruments to study effects of resistance, inductance and capacitance in a series circuit.

PHYSIOLOGY

Brain Waves Still Go On Fifteen Minutes After Death

Scientists Hope From This Experiment To Learn More About Function of Nervous Tissue Like That in Brain

BRAIN WAVES go on after death. A four-man team of research scientists announced this discovery at the meeting in Boston of the Federation of American Societies for Experimental Biology. The scientists do not think this is a sign that brain activity of conscious, thinking variety continues after death. But the experiments may lead to a greater knowledge of how nervous tissue like the brain functions.

The experiments were reported by Dr. Morton A. Rubin, Dr. Hebbel E. Hoff, Dr. Alexander W. Winkler and Dr. Paul K. Smith, of the Worcester, Mass., State Hospital and Yale University School of Medicine.

Brain waves are the records of electric currents discharged during brain activity, which scientists have been using in the study of such disorders as epilepsy. They were hailed, when first discovered, as being likely to throw as much light on brain functioning as familiar electrocardiograms shed on heart function.

The discovery that these brain waves, and therefore the brain activity responsible for them, continue after death may make it necessary to revise some of the ideas of what the brain waves mean.

In cats, the scientists reported, brain waves continued for fifteen minutes after the animals had stopped breathing and their hearts had stopped beating. The deaths were of a rather special kind, even in these days of high explosives and other lethal devices. The deaths followed injections of calcium, potassium or magnesium.

In death due to the cutting off of oxygen or of the blood supply to the brain, the brain waves stop within a few seconds. After the chemical deaths, the waves continued for fifteen minutes and might have gone on longer if the scientists had been able to continue their observations for a greater period.

Science News Letter, April 18, 1942

BOTANY

Scarce Drug and Food Herbs Can Be Produced in West

Shortage of Four Most Important Vegetable Drugs Could Be Made Up From Less Than 1,000 Acres

WAR has caused an acute shortage in plants used for drugs, insecticides and cooking herbs, yet all that we are missing of the four most important vegetable drugs could be supplied from less than 1,000 intensively cultivated acres, Prof. William J. Bonisteel of Fordham University's botany department told the meeting of the Herb Conference in New York.

The pre-war supply of these small but important quantities of pungent and potent plant products came from a large number of sources. The war cut off the supply from more than 50 countries, and reduced our total drug imports from overseas by over 55%, Prof. Bonisteel stated.

Amateurs were warned against plunging optimistically into the breach, despite the fact that all the missing drugs and related products can be raised somewhere or other in the Western Hemisphere. Finding congenial soils and climates is a job for skilled botanists rather than inexperienced beginners.

The four drugs that could be raised in sufficient quantities to supply all U. S. needs on 1,000 acres are digitalis, belladonna, stramonium and henbane. Of digitalis, standard heart remedy, we need only as much as can be raised on 100 acres; to meet the needs of all Western Hemisphere countries only 200 acres would be enough. A large number of growers are raising digitalis now, and will probably meet the demand quite adequately.

Belladonna was raised in quantity last year, but the quality was low. For the 1942 season a New York firm is undertaking an ambitious program of supervised cultivation by a number of growers. Henbane also seems to be on the way to successful domestic production.

Stramonium is a product of the common jimsonweed, that grows wild in great abundance. Prof. Bonisteel suggested that Boy and Girl Scouts might perform a patriotic duty and at the same time raise funds for their troops by collecting it.

Some of the other drug plants that can be satisfactorily cultivated either in this country or elsewhere in the Hemisphere include castor oil beans, ginger, orris root, citronella, henna, ergot, and the numerous pungent seeds of the anise-dill-fennel group.

Science News Letter, April 18, 1942

Important in Cosmetics

HERBS are important not only in the medicines that help us to get well when we are sick, but also in cosmetics that aid Milady's beauty. Some of their uses were outlined before the meeting by Miss Mala Rubinstein, of Helena Rubinstein, Inc. Women have used herbs for cosmetic purposes since the earliest days of civilization, and even our prim Victorian great-grandmothers, far from banishing them as frivolous, cultivated them assiduously.

Among the herbs most favored in modern cosmetic practice are rosemary, sage, chamomile, wild pansy leaves, fennel and roses. And, believe it or not, nettles are an ingredient of an effective hair wash!

Science News Letter, April 18, 1942

Goldfish can survive freezing of the water they swim in.

Oysters grow best in waters with strong tides or currents to carry food to them.

A maker of children's games and orange squeezers has *converted* his plant for the production of gauges, dies and bullet punches, according to the War Production Board.

RESOURCES

Packages Don War Garb

Glass Jars Replace War-Needed Tin Cans at Grocery; New Ways to Wrap Everything From Fish to Plane Parts

By WATSON DAVIS

THE PACKAGES that you buy in grocery, drug and other stores are going into wartime garb for the duration.

Tin, transparent plastic sheetings, metallic foils, and rubber have enlisted in the service of supply of our armed forces and little of these precious materials will be used for packaging the things that civilians can buy.

Glass is taking the place of tin cans, which actually are cans of sheet steel coated lightly with tin.

Waxed paper is replacing aluminum or tin alloy foils in candy and cigaret wrappings.

Wood, china and clay products are coming into vogue again as containers for many things on grocery and drug store shelves.

Cellophane, pliofilm, and other plastic wrappings that have found such wide use in packages in recent years are becoming unavailable except for a few products.

When tin became critically scarce due to the capture of the Malayan sources by the Japs, there was the hope on the part of some that we might go on having our food and other products in cans due to the successful development of plastic coatings for iron cans. Beer in cans was made possible by such plastic coatings, because beer and tin do not get along very well together. But the plastics used in these coatings have been in large demand for war uses and the plastics production facilities and the raw materials used have been strained to the utmost by the war demands.

Even paper, most plentiful of packaging materials in this war, has not been available in as large quantity as desired and the packaging industry has constantly searched for more economical methods of its use.

The packaging industry, one of the largest in America, has met the new conditions with the ingenuity and resourcefulness that it developed in creating the thousands of new containers that have been produced in more peaceful years.

This year's packaging exposition being held this month in New York emphasizes the quest for material substitutes and more efficient methods. The 11th annual package competition sponsored by Modern Packaging magazine shows that even during the defense era there were many novel packages created to reduce costs, increase sales and deliver goods in better shape to the housewife or other consumer.

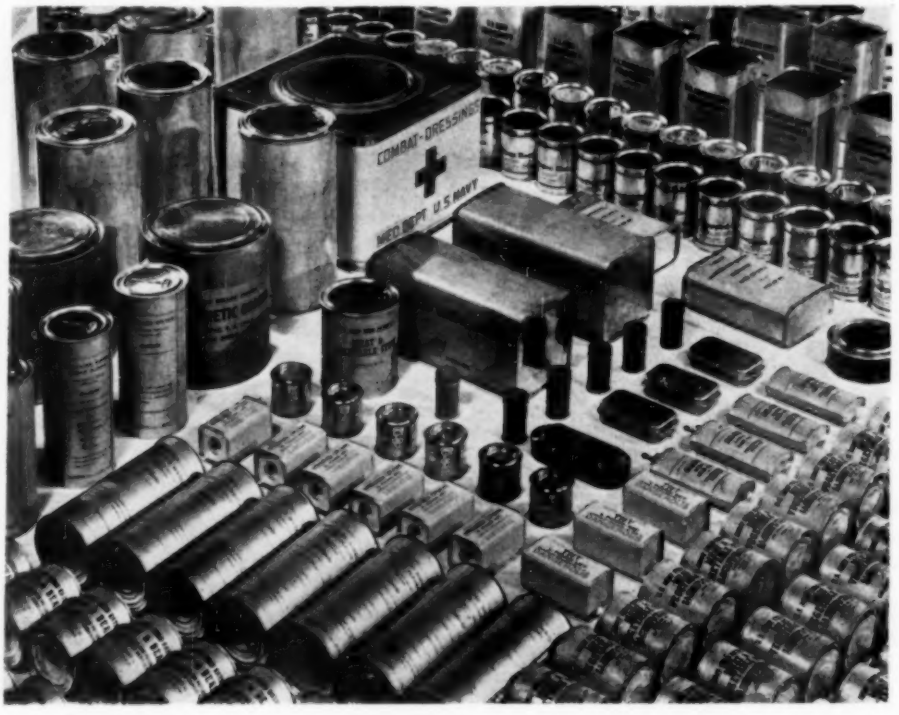
Wartime America will not revert to selling things in bulk, as was done in the days of the cracker barrel in the warm radiance of the country store's stove, but there will be a trend toward the sale of things to eat in large quantities, such as larger cans, larger bottles, and larger cartons.

There are money-saving reasons for this. A half-gallon container of milk, for instance, weighs only 32 ounces, which is just half the weight of the glass needed to deliver the same milk in half-pint bottles.

The smaller tin can sizes are "out" for the duration and apartment dwellers used to getting dinner out of cans built for two servings will have to plan differently. A considerable number of products, such as pork and beans, tobacco, beer, apple butter, mushrooms and dog food, are not being allowed to use tin cans at all.

Glass jars, bottles, glasses and cups that must take over the civilian canning job will be simplified and shorn of unnecessary material and decoration. This is true also of many other sorts of containers, from paper boxes to bags. The openings of glass containers are to be made smaller so as to reduce so far as possible the amount of material needed for closures, which may be rubber, plastic or some other material that is short.

Corks, of course, due to the fact that most of this tree bark is produced



ENLISTED

Precious tin cans have gone into war service. This photograph by the American Can Company shows a display of canned articles for the armed forces—rugged containers that can withstand rough usage.

CARRYING ON AT HOME

Taking over duty on the home front are these glass jars which will soon fill the shelves of the corner grocery. The photograph is from the Owens Illinois Glass Company.

around the Mediterranean area, are largely unavailable. Plastic closures or little wads of plastic-treated paper under caps allow us to get along without cork very well.

Many of the wartime packages are being so planned that the purchaser will be willing to carry them home without wrapping, thus saving paper. The free advertising that the unwrapped packages give the product will not displease the producers.

One of the top winners in this year's package contest consists of an outfit for dispensing human blood plasma such as is used for transfusions in war or in everyday accidents. Special bottles and apparatus for intravenous injection are included. *(Turn to page 250).*

WILDLIFE

War Changes the Problems Of Wildlife Management

Ban on Production of Hunting Firearms and Ammunition And Limitation on Auto Travel Will Decrease Hunting

WAR has made radical changes in the problems and possibilities of wildlife management, the Seventh North American Wildlife Conference, meeting in Toronto, was told by Albert M. Day, assistant to the director of the U. S. Fish and Wildlife Service.

"We have long talked about 'conservation for use'," said Mr. Day. "While carefully watching to see that the definite conservation gains of the past are not sacrificed, isn't it possible by better management to increase the surpluses of this renewable resource and then encourage a wider use?" he asked his colleagues.

The speaker called attention to the decreased intensity of hunting likely to result from the ban on production of new hunting firearms and ammunition, and the decrease in auto travel that will take place as cars and tires are worn out. He suggested a planned and managed program of hunting, not primarily for recreation, but to realize upon the nation's food and fur resources represented by the removable wildlife surpluses.

Science News Letter, April 18, 1942

Canada's Fur Resources

CANADA'S Deputy Minister of Mines and Resources, Dr. Charles Camsell, C.M.G., re-emphasized the sentiments of his American fellow-conservationists in a review of Canadian natural resources. Furs, both trapped in the wild and raised on fur farms, figure importantly in Canada's economy, he stated. Muskrat marshes, once regarded as a mere wasteland, are now recognized as valuable sources of wealth and are managed accordingly.

Food as well as fur can be realized from Canada's vast stretches of forest and plain, lake and swamp, uncultivated but nevertheless richly productive.

Science News Letter, April 18, 1942

"Wildlife-Land"

THIRTY-MILLION acres of American land, unsuited for crops, range or timber, await a new classification, Verne E. Davison of the U. S. Soil Conservation Service pointed out. He called for a new, "wildlife-land." Much of this is on farms, intermingled with cropland and pasture, but not used for either purpose. Natural wildlife-lands, Mr. Davison said, include such areas as steeply sloping stream banks, rock outcrops, ill-drained bottom lands, thick brush and scrub, and swamp or marshlands. If such areas are frankly recognized as best suited for the production of wildlife and not forced into categories where they will only waste labor and money in mis-development, farmers and the nation generally will be the gainers.

Science News Letter, April 18, 1942

Pheasant and Quail

PHEASANT and quail raising by states and provinces is now a solidly established business in the United States and Canada, with production on a million-bird basis in pheasants and about a third that big in quail, Ralph B. Nestler of the U. S. Fish and Wildlife Service, reported. The 1,042,000 pheasants raised or purchased by the states in 1940 represent almost a doubling of the figure for the previous year. The number of farms raising pheasants now amounts to about a thousand, with the quail farms approximately one-third as numerous.

Science News Letter, April 18, 1942

There is no evidence that healthy persons need more *vitamins* than can be obtained in a good diet.

Converting Scrap Into Useful Articles

How to Make An Electric Forge

SCIENCE
Serving Science Clubs of America

By JOSEPH H. KRAUS
Editor Science Clubs of America

Improvising substitutes from pieces of metal and discarded parts may become a sport in which every true American will take an active part.

Here is an opportunity for him to demonstrate his inventive turn of mind and, at the same time, put into use some of the material now relegated to the scrap heap.

"Because of a shortage of many common items in the home," states a U. S. Department of Agriculture report, "it will be necessary to improvise substitutes from pieces of metal and discarded parts. The variety of things that can be made in garages, particularly where there is a forge, is almost endless. The Bureau of Agricultural Chemistry and Engineering mentions such things as gate and door hinges, latches, braces, brackets, and rings."

An electrically operated forge can be made from an old vacuum cleaner, automobile brake drum, and a few iron scraps. Here again discarded parts are utilized.

The diagram on this page illustrates how this is done. A large auto brake drum (1) is fitted with a cone (2) at least 5" long. The diameter at the top should fit the opening on the inside of the brake drum. For this purpose, sheet iron is quite suitable. Tabs are cut at the top of the cone and holes are punched or drilled through them in line with holes in the brake drum. The cone and brake drum are then bolted together. At the bottom this cone is fitted with a short "T," the side arm of which connects with the blower side of a vacuum cleaner.

Any old vacuum cleaner (3) will work, just as long as the motor runs and the fan blades are still in fair condition. You do not need a powerful blast of air in a forge; instead you need an even supply, easily regulated.

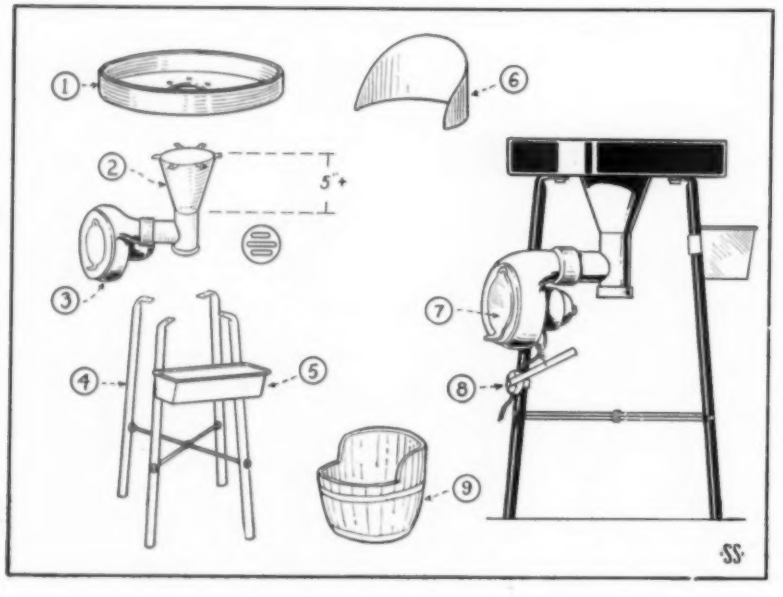
In many vacuum cleaners it will be found that the "suction" nozzle can be removed entirely or this nozzle can be cut off with a hacksaw. However, some of the modern, streamlined units are not amenable to this change. If a change can be made easily a simple air control (7) should be attached to the air intake side of the cleaner. A single bolt and nut with a lock washer holds this in place. The fit should be tight; the port should remain in any pre-set position.

If the vacuum cleaner cannot be treated in this fashion the nozzle should be fitted into a block of wood having a cut-out port. Molding around this port and a sliding wooden closure then may be used to regulate the draft.

The switch (8) preferably should be of the one-way type, that is, it should automatically turn off except when pressure is applied. But any other switch will serve the purpose just as well if a spring is used to bring it back to the "turned off" position.

Old iron pipe, one inch or larger in diameter, makes the legs for this forge. The pipe is cut off to the desired length and then the ends are heated in a coal fire or gas flame, hammered flat and bent over at the top. Holes are drilled through the legs and through the brake drum. The legs are then attached with ⅜-inch machine bolts. Two crossed tie-rods are fitted to the bottom of the legs as shown in the illustration.

If the forge is to be used out of doors, or in a place where there is likely to be a draft, it is recommended that a draft screen, made as shown at 6, be attached to the brake drum. On the other hand, if the forge is to be used in an enclosed space it should be provided with a hood and connected with a pipe leading to the out-doors. In either event one or more trays (5) should be attached to the legs. The one illustrated is for fuel.



Referring again to detail 2, it is recommended that the bottom of this "T" be provided with a cleanout door. The method of doing this will suggest itself to the builder. The door may be held closed by a spring or it may be a friction cap or plug.

A round, iron disc, about 3/16ths of an inch thick, should be slotted as shown in the insert detail. This disc should fit the bottom of cone 2 (which in smithy circles is called the tuyere).

For practical smithing the tools found in the average home or garage are not exactly suitable.

Of great importance is a suitable anvil mounted on the end grain of a well-placed wooden block or log. The anvil should weigh 120 pounds or more and ring true when struck with a hammer.

Again you will have observed that these anvils are not set solidly on the block. When struck by the hammer the anvil bounces an imperceptible fraction of an inch. This is a very desirable performance because in that way iron scale is knocked off the face of the anvil.

Other suggested tools are a ten-pound sledge, a four-pound cross-peen, and a two-pound ball-peen hammer. Then the blacksmith will need such tools as hot cut, cold cut, gouge, flatters, swages, tongs, bending blocks, a tin can perforated at the bottom for sprinkling water and a water trough which may be a barrel, cut off as shown at 9.

If you are ingenious you will be able to make many of these tools as well as others.

To start the fire in the forge place an ordinary brick down into the tuyere. Bank good coal, free from sulfur, around this brick, then remove the brick and put wood shavings into the hole so formed. Light the shavings. When they have burned down well add some pieces of coke and apply a gentle blast. Dampened coal should be banked around the fire. This coal, properly charred, should be used for replenishing the fire. Coal around the edges of the fire should be kept wet enough to prevent combustion. This operation insures a constant supply of hard coke.

Never increase the draft to such a point that you will have a large fire.

When a piece of metal is not being heated the blower turns off automatically. This conserves coal and prevents the fire from getting out of hand. The size of the fire is regulated by opening or closing the air intake port.

Do not attempt to forge cast iron. Also, be sure that there are no brass, lead or bronze parts in the fire.

E OBSERVER

f Ame a Sponsored by Science Service

The piece of iron or steel which is to be worked is placed in the fire and heated slowly and uniformly. The heat must penetrate to the innermost portion. Depending upon the nature of the material, the color of the metal may range from a dull cherry red color to a high lemon yellow. Ordinary steel will give a full red color. If the right temperature has been reached the metal will yield freely when scraped with an iron poker.

When the metal piece has reached its flowing temperature remove it from the fire, smack it against the anvil (or use a wire brush to remove any scale) and then hammer.

Proficiency in handling metal is the first step. After a little practice you can experiment with the making of a simple bracket.

Tongs should always fit the metal which is to be handled. If they do not, the jaws of the tongs should be placed in the fire and, when hot, they should be hammered around the metal piece. If this hammering brings the handles of the tongs too closely together, heat the jaws again, insert a piece of iron between the handles to keep them separated, and then flatten the jaws against the piece which is to be worked.

To make a good bracket it is desirable that the work be upset first as shown at B, in the diagram on this page. The center of the piece which is to be bent is first heated to the proper temperature and then struck on the edges to form a bulbous portion at the midpoint. Properly to confine this "bulb," a perforated tin can is used to spray water upon the metal adjacent to the part being worked; this is illustrated at F. After the upset has been formed, the piece is heated again and bent to form the bracket C. To bend a flat strip along its wider dimension see details D and E.

In illustrations G, H, I, J and K you will see several suggestions for forming joints. Notice that in each case the ends of the pieces have a slight convex surface, the purpose of which is to squeeze out the scale.

Heat both pieces uniformly. Then shape them to get them ready for the weld. Heat again, and place the two pieces on the anvil. Brush off the scale with a wire brush (or cover with flux) and then hammer together at an angle so that, as the weld proceeds, the scale will be squeezed out. If the parts get cold, heat them in the fire again.

A satisfactory flux is ordinary borax, heated in a crucible until liquid, then poured on a flat surface. When cool pulverize this with a hammer. Ordinary sand also is satisfactory. Either may be sprinkled on the hot metal where it serves to flow out the scale.

The plain lap weld down at J is used most frequently. This is first knitted at the center and then gradually hammered down to force out any scale.

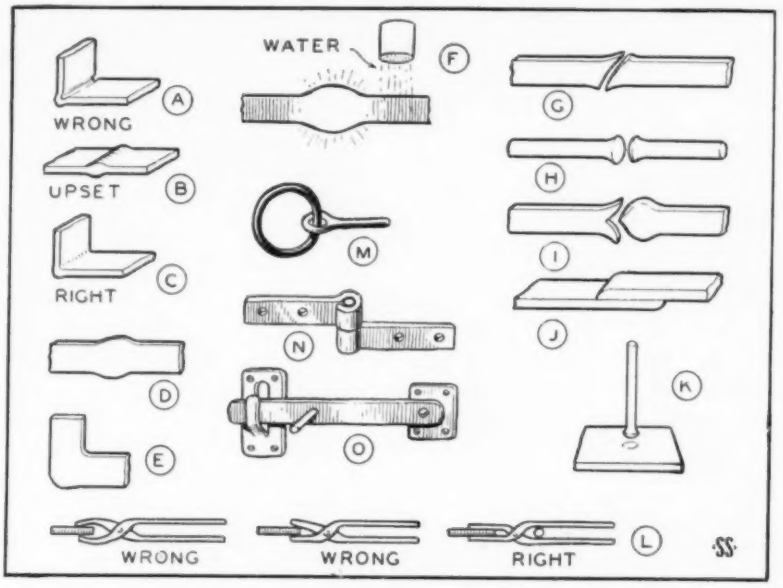


Diagram K illustrates the making of such things as metal stands, engine valves, etc. Note that the bottom of the rod is rounded. This fits into a slight depression in the plate. Both pieces must be heated to welding heat and then hammered together.

After you have gotten this far you will want to swage down pieces, making them either thinner, heavier, longer, rounder, flatter, etc. After some practice you will want to do all sorts of work with iron and steel. A few of the simpler suggestions are given at M, N and O in the diagram.

Science News Letter, April 18, 1942

NEWS OF CLUBS

COMMERCE, Texas—The TexSciana, a magazine devoted to the work of the Texas Junior Academy of Science, reports on the Dallas meeting held on Dcember 31 of last year. The 30 mimeographed pages of this periodical are filled with experimental information, reports of Academy Chapters and schedules of forthcoming meetings. A special department has been set aside under the name of "Tradin' Post." Science club members are invited to use this department to arrange for exchanges of plant specimens, insects, reptiles, minerals, etc. Such a "tradin' post" might well be included in most school magazines. It offers every student and club member an opportunity of disposing of surplus stock and getting materials which he needs, some of which may be difficult, if not impossible, to secure today.

Editors McIver, Ervin, Laves and Hayes, and Mrs. Barry Walker, chairman of the Junior Academy Committee for Texas and Director of the Texas Science Center, deserve a great deal of credit for a fine job.

ST. LOUIS, Mo.—An artificial stomach with a heating unit with which to study the effect of vitamins on the digestion of milk has been made by Gerald Perkoff. Gerald also was elected honorary junior member of the American Association for the Advancement of Science from the St. Louis area.

CAPE GIRARDEAU, Mo. — The Southeast Missouri State Teachers College met here. Exhibits and programs showed a marked war influence. A demonstration of black light was given by Elwood Mills and Michael Summers of Central High School. Madelyn Comfort of the Burbank Chapter at Beaumont High School, displayed "Living Casts of Honey." Synthetic Rubber and Plants and the War were featured by Francis Smith and Margaret Harris of the Carver Chapter at Vashon High School. Plastics were shown by Marilyn Shouse of the Davy Chapter at Normandy High School and Strategic Materials for Defense were exhibited by Edgar Thorpe of the Phy Bi Knights Chapter at Flat River. A repelling magnet, a quadrant electrometer, water softeners, oscilloscope, electrolysis, potassium and refrigeration also were demonstrated. Warren Harter, president, presided. Ernestine M. J. Long is Director of this Missouri Science Center.

SALEM, Mass.—The Weizmann Amateur Science Club of Salem, Mass., is seasonally publishing a small magazine under the name of Science News. The editors and advisers hope that this venture will be sufficiently profitable to help equip a club laboratory for which space has already been obtained on the third floor of the Salem Community Center. Leonard J. Sushel is the sponsor.

JACKSON, Mo.—The production of a device to set up air disturbances powerful enough to throw an airplane out of control is being undertaken by the chemistry committee of the Jackson Junior Academy of Science with headquarters at Jackson High School. The Physics group is building a film enlarger while the Biology group is collecting and identifying as many invertebrates as can be found in the region of the club. The club plans to present a program at a local college soon. The sponsor is A. Paul Vance, Head of Science Department.

Clubs are invited to become affiliated with SCA for a nominal $2 for 20 members or less. You can become an associate of SCA for 25 cents. Address: Science Clubs of America, 1719 N St., N.W., Washington, D. C.

Science News Letter, April 18, 1942

SCIENCE CLUBS OF AMERICA

SCA, under Science Service sponsorship, continues the pioneering activities of the American Institute of City of New York over the past 15 years and the Student Science Clubs of America which was merged with that movement. The American Institute continues to foster the regional activities of the junior clubs of the New York City area as a science center.

To effect close cooperation between the American Institute and Science Service, an advisory committee on SCA is being formed.

The principal SCA staff consists of Joseph H. Kraus, SCA editor, and Margaret E. Patterson, SCA membership secretary, based at New York in offices at 310 Fifth Avenue, also occupied by the American Institute. H. D. Lufkin in charge.

From Page 247

A paper bag for shipping 50 pounds of potatoes was another prize winner. This replaces wooden crates and burlap bags previously used. Lower freight rates and less weight loss due to shrinkage are among the advantages.

A corrugated box for shipping airplane rudders, formerly packaged in crates or wooden boxes, won recognition as an aid to keeping essential light airplanes in operation.

An airtight transparent bag for transporting frozen fish fillets won a prize. Grocers are able to keep this fish package next to other foods without danger of contaminating them with fish odors.

A new bacon package allows the housewife to slit it open quickly and remove a few slices when needed, while the grocer does not need to wrap the package when it is sold.

A new cheese package makes it practical to sell high-grade cheese in a ten-cent retail size. The package consists of a pliofilm cup formed when hot cheese is flowed into the mold.

Another prize-winning new idea in food packaging is a bread package that consists of two half-loaves separately wrapped. In one combination half a loaf of white bread is twinned in the new package with half a loaf of wheat bread.

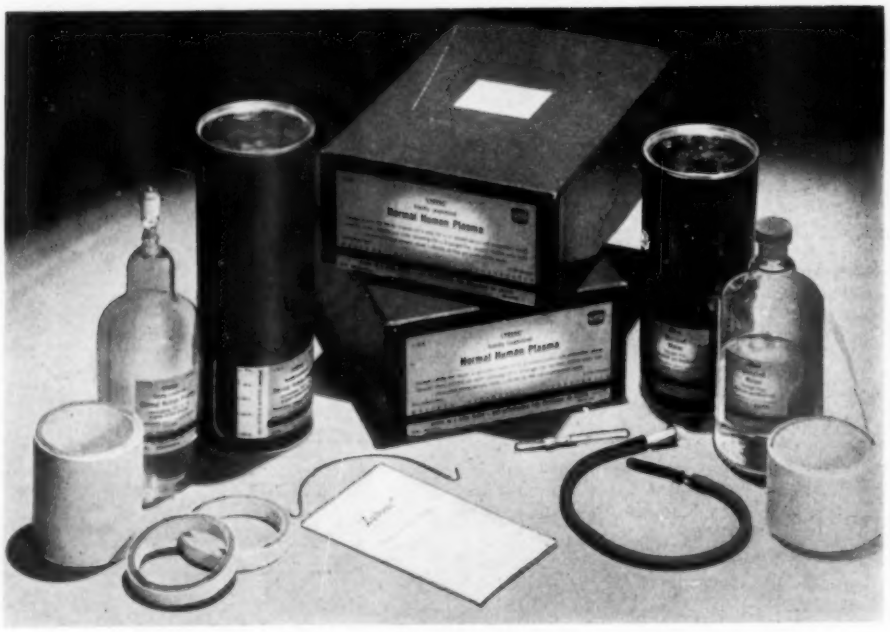
A new macaroni package uses a new method of closing the package when only part of the amount is used at one time. Lifting one tab opens the hexagonal carton, which is simply closed by pressing the end back in place.

Even ink is dispensed in new dress. The bottle is shaped so that the small hand of a school child can grasp it safely while pouring, and the bottle never "gurgles" and spurts out its content.

Pies can now be made with a very crisp, crunchy crust, thanks to a new pie package that protects the pie even when stacked on the counter.

A new medicine bottle, thanks to a new design recognized in the competition, saves 44% of the space on the shelf occupied by the standard, round bottle, although it is only slightly taller.

Merchants actually ask to have their windows "broken" when they see a soft drink display which looks as though a pretty girl had just stepped through the window glass. The illusion is accomplished by lithographing "cracks" as well as the girl on a transparent sheet and putting the sheet over the real glass of the window.



NEW DEMAND

The war has brought with it the need for new sorts of packages. Here are packages for dried human blood plasma and the apparatus for restoring it to liquid form.

AERONAUTICS

Underground Quarries Shelter British Aircraft Factories

Modern Lighting Was Installed and Walls Painted To Bind Dust But It Was Unnecessary To Widen Space

UNDERGROUND stone quarries begun 2,000 years ago in Roman times now are giving sanctuary to British aircraft and war industry factories under constant threat of Nazi air raids.

The story of how two of these factories were set up underground is told in a recent issue of the British journal, *The Aeroplane,* (March 6) just received here.

In the first site surveyors, guided by quarrymen who alone knew the planless cities of darkness, made their blueprints for a factory to be artificially heated, ventilated and lighted. One surveyor who strayed from his party was lost for two days. When the quarry was mapped, workmen and electricians swarmed through the cool, dark corridors and the ancient stone, once chipped by hand, now yielded to swift pneumatic drills.

Except for adding another million cubic yards of space and strengthening supports, engineers made their factory comply to the quarry. It was unnecessary to widen or straighten the streets and avenues. Walls and roofs were painted yellow to bind the fine dust which could damage precision machinery.

Elevators and escalators were built for factory workers and machinery, fluorescent lights installed, ventilators built and canteens and lavatories provided for.

This site is now nearly complete. Six hostels, each quartering 1,000 men or women, are planned, and married quarters for another thousand. The latter will be little bungalows, built in pairs. There will be front and back gardens, even lawns.

The second underground factory is now complete. It is entirely air-conditioned, and the temperature kept from

60 to 65 degrees Fahrenheit. The main canteen, or restaurant, is above ground, but a small room for making tea is underground, and tea is served on trolleys to men and women at work.

Feature of this factory is the Control Room, built in an old seepage pit. It is linked to all parts of the factory by telephone, loudspeaker and microphone. Hourly production records are made, and by a glance at the charts the managing director can check any section.

In both underground factories, irreplaceable machines and skilled workmen are safe from the most severe bombing.

Science News Letter, April 18, 1942

PHYSIOLOGY

Excessive Acid in Nerves May Cause Altitude Ills

When Nerves Are Too Acid, They Discharge Excessive Quantities of Acetylcholine Which Affects Muscles

EXCESSIVE acidity of the nerves may be responsible for a host of serious ailments, including the dangerous condition that overcomes high-altitude flyers and mountain climbers, Dr. Robert Gesell, of the University of Michigan, announced at the meeting of the Federation of American Societies for Experimental Biology in Boston.

The acid nerve condition which may be responsible for pilot failure in high-altitude flying without oxygen cannot be counteracted by the soda bicarbonate or other alkaline powders which the layman takes for his so-called acid stomach. Excessive alkalinity of the nerves may cause just as much trouble as excessive acidity, but it cannot be corrected by taking lemon juice. Neither acids nor alkalis that people could take into their stomachs would change the acid or alkaline state of the nerves. To change nerve acidity requires injections directly into the veins of the very powerful alkalizing or acidifying chemicals.

The degree of acidity or alkalinity of nerves that makes the difference between health and serious illness is actually rather small. But the shift from just the proper balance to excessive acidity or alkalinity of the nerves may influence all body processes, including breathing, heart action and digestion, Dr. Gesell believes.

When the nerves are made too acid, he discovered, they discharge excessive quantities of the chemical, acetylcholine. It is this chemical, many scientists believe, which causes a muscle to move in response to a nerve impulse. Sometimes muscles go on moving long after the nerve impulse has ceased. A familiar example is the trembling that follows prolonged or excessive physical exertion. Epileptic fits are attributed by some scientists to the same mechanism, which is called the after discharge. The theory is that the nerves continue to release acetylcholine which, as it piles up in the muscles, keeps them contracting. Excess acid, Dr. Gesell's experiments show, is responsbile for this condition.

Why the nerves become too acid or too alkaline is not entirely known. Too little oxygen and too much carbon dioxide apparently can cause acidity, and the reverse can cause alkalinity. Increasing nerve alkalinity, Dr. Gesell found, facilitates the destruction of the nerve chemical, acetylcholine. This might lead to paralysis. A kind of convulsion accompanied by muscle cramps, called tetany, and coma or unconsciousness, are other conditions which may be explained on the basis of acid or alkaline nerves, Dr. Gesell believes.

Working with him on the experiments were Prof. Charles R. Brassfield, Elwood T. Hansen and Arnold Mason, also of the University of Michigan.

Science News Letter, April 18, 1942

BOXED AIRPLANE PART

This airplane rudder is partly packed and ready to slip into its carton for transportation to the assembling plant.

● RADIO

Saturday, April 25, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Frank C. Hibben, of the Museum of the University of New Mexico, will talk on discoveries in Sandia Cave.

Tuesday, April 21, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

Mrs. Katherine Fowler Billings, New England Museum of Natural History will describe "Prospecting for Gold in West Africa."

One in a series of regular periods over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.

★★★★★★★★★★★★★

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PUBLIC HEALTH

Business Executives Warned Against High-Speed Work

Average Executive Is Frequently Nervously and Physically Fatigued and Tense; May Die Early

BUSINESS executives are inclined to eat too much, smoke to much, work and play too hard, and rest too little—as a result they may die early of heart, circulatory or kidney disease.

This was the essence of an address by Dr. Harold C. Habein before the meeting of the American Association of Industrial Physicians and Surgeons and the American Industrial Hygiene Association. Dr. Habein practices at the Mayo Clinic, where he examines American businessmen who come for annual check-ups.

Dr. Habein declared the executives of this country have been working at top speed for years. "But now, because of the national emergency, speed must be increased even more. That this is going to have a deleterious effect on health in high places can hardly be doubted."

"The average executive," Dr. Habein said, "is likely to have bad working, recreational, eating, smoking and drinking habits. He is frequently nervously and physically fatigued and emotionally tense. His working hours are not governed by union rules, but by an inward drive which we call 'ambition', and intense competition."

Dr. Habein traced this trend to the beginning of the first World War.

"In the years since that time a marked increase in industrial activity has occurred with a natural concentration of a greater proportion of our population in large cities. Life has been greatly accelerated by the development of the automobile and airplane. Smoking, and particularly the smoking of cigarettes, has increased tremendously, and the same is true of the use of alcohol. The home as the social center has largely disappeared. Crime and insanity have increased. And what have we gained? Material things? Yes! More automobiles, ice-boxes, radios, bathtubs; but we have gotten into serious trouble, too. The 'good life,' the '*gemuetlich* life' has disappeared."

Dr. Habein stated that in his considered opinion, as a result of this top-speed work and play, diseases of the heart and circulatory system "are definitely on the increase in the population in general and among executives—those who earn their living with their minds rather than their bodies—high blood pressure, hardening of the arteries and coronary thrombosis, are not only a more frequent cause of death than formerly, but they are causing disabilities in a younger age group than ever before."

Science News Letter, April 18, 1942

MEDICINE—AERONAUTICS

Improved Design of Planes From Museum Work

GREATER safety of combat planes and better treatment of war wounds and burns among civilian and military personnel are expected from a new activity of the Army Medical Museum.

This institution, it is announced, will act: 1. as a collecting center for specimens and models of injuries peculiar to the present war; 2. as a recruiting center for specially trained personnel, particularly clinical photographers and medical artists, who can serve with expeditionary forces and in larger army hospitals, to collect specimens and pictorial records of diseases and injuries and their treatment, weapons and protective devices.

Study of this material will give surgeons a better idea of the type of wounds they will have to treat in the present war, and of the results of various methods of treatments. It will also give aircraft designers a clearer picture of the injuries peculiar to particular types of aircraft and how best to protect the flying personnel against such hazards.

Doctors in civilian practice are urged to send material arising from airplane crashes, civilian bombings, fires, gunshot wounds and specific epidemics. In the case of airplane crashes, for example, the temporal bones from the skull and a record of the number of flying hours

are specified as material that should be collected if possible.

Details of this new activity of the Army Medical Museum and request for cooperation by civilian doctors are given in a letter just sent by the museum's curator, Col. J. E. Ash, to members of the American and Canadian Section of the International Association of Medical Museums, the American Association of Pathologists and Bacteriologists and the American Society of Clinical Pathologists.

Science News Letter, April 18, 1942

PUBLIC HEALTH

Treatment of Carriers May Prevent Dysentery

DYSENTERY outbreaks in Army camps and in civilian institutions such as hospitals and prisons may be prevented by one of the newer sulfa drugs, sulfaguanidine, Dr. Lowell A. Rantz and Dr. William M. M. Kirby, of San Francisco, suggest (*Journal, American Medical Association*, April 11).

In nine out of 11 patients, 10 of whom were regarded as healthy carriers of dysentery, sulfaguanidine treatment banished the dysentery germs, the San Francisco doctors report. As a result, the patients were no longer disease spreaders.

The healthy carrier of dysentery germs is probably the source of most cases of sporadic infection and if working in the kitchen of a camp or hospital may be responsible for serious outbreaks of the disease. If the sulfaguanidine treatment lives up to its present promise it should be a valuable aid, the physicians state, to the control of the spread of bacillary dysentery.

Science News Letter, April 18, 1942

BOOKS

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New Machines And Gadgets

Novel Things for Better Living

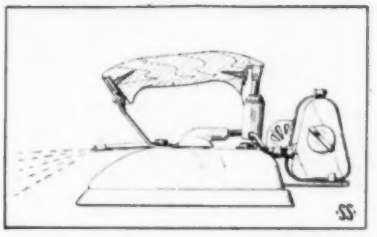
Pulling up dandelions from your lawn, either with the idea that there might be a little speck of rubber in them or for the more esthetic purpose of beautifying the lawn, is made less wearisome and more effective by a new garden implement just patented. On the end of a long pole is a metal prong which is pushed into the ground near the the dandelion. This loosens the roots. The act of pushing down on the pole opens a swinging clamp near its lower end, while pulling up on the pole closes the clamp. The weed is thus neatly grasped and pulled. The implement can also be used for other weeds.

Light paper caps, weighing only half an ounce, are now available to industrial workers to protect their heads from the light dusts common in many plants. The paper is made to imitate linen cloth so that the cap looks neat and stylish. By an ingenious device the size of the cap can be adjusted to fit the head. Cap sizes are marked on the sweatband so that the adjustment can be instantly made. The caps also serve a second purpose because they carry slogans for safety education.

An all-purpose electric tool is now within the means of most any home mechanic. It can be used for drilling holes, for grinding, sharpening, wire brushing, sanding, buffing, for sawing, etching and engraving. Attachments are available for all these uses. It can be operated with one hand, the switch being so located that it can be operated with the same hand that holds the tool.

Blood bank refrigerators of special cylindrical design are now being made for use in hospitals. Revolving shelves can be turned so as to bring the desired type and quantity of blood immediately within reach of the hospital technician. Precious time is thus saved in emergency cases by eliminating the necessty for unloading shelves or fumbling around to find the right bottle. The temperature is regulated to within two degrees, rather finer than with the ordinary household refrigerator.

Sprinkle the clothes and iron them too without stopping. One hand only is required, leaving the other free to do whatever else you may wish to do with it. When you wish to operate the sprinkler system attached to the iron depicted here, you simply press down on the back end of the handle and go right on with your ironing. If conditions ahead are sufficiently moist, you put all the pressure on the front end of the handle, as you ordinarily would in



ironing. Of course you must fill up the little tank on the back end before starting. The inventor has just got a patent for this little time-saver.

In case of snake bite, it would be convenient to have a little snake venom extractor, recently patented, handy in your pocket. The extractor is in essence a miniature suction pump that draws the poison out of the wound. It has two nozzles of different sizes to accommodate either a small bite or a large one, one on the finger, or one on the leg. It is packed in a cylindrical box which can also carry antiseptic tablets and bandages.

Writer's cramp and losing your pencil can both be at one and the same time avoided by a little device that attaches the pencil to your forefinger. This has recently been patented. Writer's cramp, the inventor says, is due to the pressure of the fingers exerted to support the pencil or other writing instrument. Accordingly, he provides a holder for the pencil in the form of a thimble, with the top cut off, that slips on the forefinger with the pencil attached alongside. The writer thus only has to steer the pencil. He doesn't have to hold it up. Also, he can't lose it if he keeps it attached to his finger while it is temporarily not in use.

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin No. 100.*

Science News Letter, April 18, 1942

The world's first *indoor oil field* has been proposed by an oil company for construction in Los Angeles—the company plans a huge concrete building inside of which all drilling operations would be conducted.

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BOTANY

NATURE RAMBLINGS by Frank Thone

Internal Thorns

JACK-in-the-pulpit, looks like a harmless and even helpless herb. Perfectly smooth, even to the overarching spathe of its flowers, and of a most tempting green, it would seem to be an easy mouthful for any wandering cow or rooting pig that might chance upon it in the woods.

But things are not always what they seem. Buried in the plant's tissues, especially in its solid underground bulb (or, more properly, its corm) are millions of microscopic needle-shaped crystals of calcium oxalate, by-products of its metabolism. These are in effect its internal thorns, for they pierce and lacerate the tongue and mouth lining if the plant is chewed.

The wounds, though very numerous, are so minute that by themselves they would cause no grief. But there is an acrid substance in the sap that follows the crystals into their tiny cuts, and sets up a most disagreeable stinging sensation. One Indian name for the plant was "memory-root."

If you care to find out why it got this name, dig up a Jack-in-the-pulpit—being careful to take one where there are plenty of others to make the loss good. Cut the corm in two with a sharp knife. Rub the fresh surface on your tongue. (N.B.: Don't under any circumstances bite or chew it!)

At first, you will think nothing has happened. But after a few seconds you will realize that something very decidedly has happened. There will be a feeling in your tongue as of ten thousand tiny red-hot imps dancing around. It will do you no good to rinse your mouth, or to wipe your tongue with a handkerchief. All you can do is grin and bear it—or at least, bear it.

Unless you have been so rash as to get an overdose, no ill consequences will ensue. Gradually the hot prickling will subside, and after a quarter of an hour or so will stop altogether. You will then be an initiate of the Order of the Memory-Root.

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ARCHAEOLOGY

Oldest Story in the World Unearthed For Study

Myths of Creation and the Garden of Eden, Written 1,000 Years Before the Bible, Are Now Deciphered

THE world's oldest story can now be told. Myths of Creation, the Garden of Eden and the Deluge, written a thousand years before the Bible, have now been deciphered from Sumerian cuneiform tablets found buried in Iraq.

After ten years of study, Dr. Samuel N. Kramer, of the University of Pennsylvania Museum, has reconstructed "the oldest literature in the world." This Sumerian literature, dating back to 3,000 B.C., profoundly influenced the Christian, Hebrew, Greek and Mohammedan cultures, but its existence was never even suspected until a few years ago.

The Sumerians themselves, whose culture and invention of the cuneiform writing were assimilated by the Babylonians and Assyrians, left not a single trace of their civilization in the Biblical or classical literature. The very name Sumerian was erased from the mind and memory of man for over two thousand years.

The Nippur excavations in modern Iraq, begun in 1890 by the University of Pennsylvania, brought to light 30,000 cuneiform tablets and fragments, 2,000 of which contain the literature of the forgotten Sumerians. These startling documents have been partially reconstructed and deciphered by Dr. Kramer. Many beautiful legends and myths are now restored, forerunners of the familiar Greek and Biblical stories. The American Philosophical Society has just published Dr. Kramer's "Preliminary Survey of the Oldest Literature in the World."

Since 95% of all the Sumerian tablets are commercial or economic in character, scholars will now have a fairly accurate picture of the social and economic life of ancient Sumer. So far, little is known about the Sumerians beyond the fact that theye were a non-Semitic race, flourishing in southern Babylonia from the beginning of the fourth to the end of the third millennium B.C., and were the dominant cultural group of the Near East during that time. They are credited with the invention of cuneiform, which made the cultural progress of western Asia possible. Their religious and spiritual concepts profoundly influenced the Hebrews and the Greeks, who became in turn the spiritual forefathers of our modern world. In addition, they produced a vast literature, largely poetic in character, consisting of epics and myths, hymns and lamentations, proverbs and "words of wisdom."

Dr. Kramer's preliminary survey includes the translation of a beautiful myth concerning the descent of the Queen of Heaven to the Nether World. The restoration of all the literature, however, will require many years to complete.

Science News Letter, April 18, 1942

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•First Glances at New Books

Additional Reviews On Page 256

GIVE TO VICTORY BOOK CAMPAIGN

CHEMISTRY

THE CONDENSED CHEMICAL DICTIONARY (3d ed.)—Compiled and edited by the editorial staff of the Chemical Engineering Catalog — *Reinhold,* 756 p., $12. Over 6,000 new items have been added, in the new edition of this book. Old items have been brought up to date, and a large number of chemical products sold under trade or brand names have been added.

Science News Letter, April 18, 1942

ENGINEERING

BOATBUILDING, A Complete Handbook of Wooden Boat Construction—Howard I. Chapelle—*Norton,* 625 p., illus., $5. This handbook, written by a well known designer of boats, is designed to meet the needs of the builder. The text covers all types of craft from flat-bottomed rowboats to ocean cruisers and commercial vessels.

Science News Letter, April 18, 1942

EDUCATION—LIBRARY SCIENCE

EDUCATIONAL MOTION PICTURES AND LIBRARIES — Gerald Doan McDonald — *American Library Assn.,* 183 p., $2.75. "If books were as hard to get as films, little reading would be done in this country," says the author. The present study, made possible through a grant from the Rockefeller Foundation, considers the value of films to the public, types of films, training of the film librarian and the library's responsibility in making motion pictures available.

Science News Letter, April 18, 1942

AERONAUTICS

AIR NAVIGATION OUTLINE—Frederic W. Keator—*Weems System of Navigation,* 95 p., $2.50. Intended to assist instructors in the Civilian Pilot Training Primary Course in organizing their work so that the brief time allotted to navigation may be used to best effect even by students with little or no previous technical training.

Science News Letter, April 18, 1942

AERONAUTICS

MODEL AIRPLANE DESIGN AND THEORY OF FLIGHT—Charles Hampson Grant—*Jay Pub. Corp.,* 512 p., illus. First publication of basic rules for airplane model construction developed by the author from an organized series of experiments conducted over more than 20 years. Those advanced in mathematics will find in the book comprehensive information, diagrams and basic formulas. Those less schooled in this field will find simple rules and data ready to be easily applied. Anyone interested in aviation should find much to absorb his attention.

Science News Letter, April 18, 1942

ECONOMICS

CRISIS IN THE PHILIPPINES—Catherine Porter—*Knopf,* 162 p., $1.50. Finished after the Japanese invasion, this is an up to date, compact and inclusive treatment of the Philippines, written under the auspices of the American Council of the Institute of Pacific Relations.

Science News Letter, April 18, 1942

TECHNOLOGY

1001 WAYS TO USE CONCRETE (2d ed.) —Harold O. Hayes, ed.—*Popular Mechanics Press,* 238 p., illus., $1.98. Those who think of concrete only as material for foundations, walls, streets and sidewalks, will be astonished at the number of other uses for which it is adapted, many of them highly artistic and ornamental, as described in this book.

Science News Letter, April 18, 1942

AERONAUTICS

AERODYNAMICS FOR MODEL AIRCRAFT—Avrum Zier—*Dodd, Mead,* 259 p., illus., $3. Through study of aerodynamics as applied to his flying models, the young student can absorb information that will serve as background for a later ground-school aviation course, the author believes. This text is intended for those with little or no technical training and only the mathematics covered in early grades of high school.

Science News Letter, April 18, 1942

BOTANY

CONE-BEARING TREES OF THE PACIFIC COAST—Nathan A. Bowers—*Whittlesey House,* 169 p., illus., $2.50. A well-prepared, well-illustrated manual for use in recognizing and studying the species of what is perhaps the world's most important conifer-forest region.

Science News Letter, April 18, 1942

AERONAUTICS

FIRST PRINCIPLES OF FLIGHT—D. Hay Surgeoner—*Longmans, Green,* 108 p., illus., $1.25. A book originating in England which is one of a series on aeronautics all written by the same author and according to the same method of teaching. It is in that convenient coat pocket size so popular among service men in England now.

Science News Letter, April 18, 1942

TELEVISION

TELEVISION, Today and Tomorrow—Lee de Forest—*Dial Press,* 361 p., $3.75. The inventor of the three-element vacuum tube that made modern radio possible tells us in simple language the whole story of television, its beginnings, present applications and probable future.

Science News Letter, April 18, 1942

ENGINEERING

AERIAL BOMBARDMENT PROTECTION—Harold E. Wessman and William A. Rose—*Wiley,* 372 p., $4. Detailed discussion of ways to make buildings resistant to the effects of bombing at reasonable cost. While much of the material is technical, it is clearly presented. Characteristics of bombs, shelter zones in existing buildings, air raid shelters, camouflage, are among other topics considered. Much of the information on the aerial bombs was obtained from foreign sources, chiefly British.

Science News Letter, April 18, 1942

TECHNOLOGY

FORTY POWER TOOLS YOU CAN MAKE —*Popular Mechanics Co.,* 96 p., illus., $1.25. Clear instructions, with illustrations and diagrams, for making power tools for the home workshop.

Science News Letter, April 18, 1942

TECHNOLOGY

MODERN PULP AND PAPER MAKING, A Practical Treatise (2d ed.) — G. S. Witham—*Reinhold,* 704 p., illus., $6.75. A new edition of a highly useful, comprehensive reference work, more important than ever now that war has made pulp a vital munitions material and paper so essential in a thousand ways that we can no longer afford to waste it as carelessly as we used to.

Science News Letter, April 18, 1942

METEOROLOGY—AVIATION

CLOUDS, AIR AND WIND—Eric Sloane —*Devin-Adair,* 74 p., illus., $2.50. This is at once a brief popular discussion of one important phase of meteorology and a picture-book of airplanes. A large share of the full-page illustrations are beautifully executed monochrome drawings of the principal types of clouds, and occupying the center of attention in each one is a modern military plane. Some of the other illustrations are cartoon-diagrams that make light work of subjects often permitted to become unnecessarily heavy.

Science News Letter, April 18, 1942

•First Glances at New Books

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GENERAL SCIENCE

THE MEN WHO MAKE THE FUTURE—Bruce Bliven—*Duell, Sloan and Pearce,* 325 p., $2.75. A book well worth reading because it surveys the present and the future of science with a broad view. The editor of the New Republic talked to dozens of scientists and he reports what they are doing, what they are thinking and what they believe science can do in the future.

Science News Letter, April 18, 1942

ENTOMOLOGY

COLLEGE ENTOMOLOGY—E. O. Essig—*Macmillan,* 900 p., illus., $5. A new general textbook by the professor of entomology at the California Agricultural Experiment Station. After an introductory section on the general anatomy of insects, the hexapod orders are taken up one by one, and each given thorough and complete treatment. Economic aspects of the subject receive special emphasis.

Science News Letter, April 18, 1942

WAR

WAR COMES TO US, The Most Dramatic Story of Our Time—John Paul Adams, ed.—*Bartholomew House, Inc.,* illus., $1. A pictorial history of the war, from Versailles to Pearl Harbor.

Science News Letter, April 18, 1942

AERONAUTICS

THE AIRCRAFT APPRENTICE — Leslie MacGregor—*Pitman,* 134 p., illus., $1.50. A book intended to provide reliable information about airplane manufacture for airminded youth of high school age and in training for the airplane industry.

Science News Letter, April 18, 1942

ZOOLOGY

WONDERS OF THE SEA — Gladys Pratt Freund; illustrated by Rudolf Freund—*Random House,* 36 p., colored illus., $1. An even third of the pages are beautifully executed color plates, and smaller illustrations both colored and black-and-white embellish the remainder. Text treatment is necessarily condensed, yet it presents interesting and accurate glimpses of the principal classes of animal life found in the sea. Really an astonishing dollar's worth of picture-book.

Science News Letter, April 18, 1942

GENERAL SCIENCE

HOW THINGS WORK, Science for Young Americans—George Russell Harrison—*Morrow,* 301 p., $2.75. Not long ago Dr. Harrison wrote "Atoms in Action" which told the story of applied physics in the modern world for an adult audience. Now he has done a job for boys and girls stimulated by the questions of boys and girls. There are a good many "whys" in the book, such as why a red book looks red, and why a lamp on a firefly's stomach is cold.

Science News Letter, April 18, 1942

AGRICULTURE

380 THINGS TO MAKE FOR FARM AND HOME—Glen Charles Cook, comp.—*Interstate Printers & Publishers,* 325 p., illus., $2.50. Detailed specifications for the building of many things needed around a farmstead. Any person handy with tools can save a good deal of money by making equipment customarily purchased. And in these days of increasing scarcity of some articles on the market, it may mean the difference between having and going without altogether.

Science News Letter, April 18, 1942

ENGINEERING

THE SCIENCE AND PRACTICE OF WELDING—A. C. Davies—*Cambridge (Macmillan),* 436 p., illus., $2.25. A British book for welders and student welders "requiring an understanding of the principles of physics, chemistry, metallurgy and electricity as applied to welding, no previous knowledge of these subjects being pre-supposed."

Science News Letter, April 18, 1942

TECHNOLOGY

CHANGES IN PACKAGING TECHNIQUES, Standardization, Display, Permeability, Gluing — Alex Pisciotta, W. L. Stensgaard and others — *American Management Assn.,* 56 p., $1.

Science News Letter, April 18, 1942

BIOGRAPHY

FAMOUS EXPLORERS FOR BOYS AND GIRLS — Ramon Peyton Coffman and Nathan G. Goodman—*Barnes,* 166 p., illus., $2. A story book about real heroes, from Leif the Lucky and Christopher Columbus to the polar explorers and flying pioneers of our own day.

Science News Letter, April 18, 1942

ENGINEERING

HYDRAULICS (5th ed.) — George E. Russell—*Holt,* 468 p., illus., $4.25. New edition of a successful text by the professor of hydraulics at Massachusetts Institute of Technology.

Science News Letter, April 18, 1942

METEOROLOGY

WEATHER AND THE OCEAN OF AIR—William Holmes Wenstrom—*Houghton Mifflin,* 484 p., illus., $4.50. Now that war has necessitated an almost complete blackout of official weather information, the subject becomes tantalizingly interesting. This book, by a man who spent many years as an Army meteorologist, is admirably suited to the needs of the serious amateur "weather man" who wants to have sound scientific basis for his efforts at forecasting, and who is interested in weather study generally.

Science News Letter, April 18, 1942

ZOOLOGY

MICE, MEN AND ELEPHANTS, A Book About the Mammals—Herbert S. Zim—*Harcourt, Brace,* 215 p., illus., $2. Facts about mammals, simply but accurately stated, illustrated with clear diagrams and many fine full-page halftones, most of them Ewing Galloway photographs. The author states that the book was written after a sort of poll taken among several thousand high school pupils, to find out what they wanted to know about animals.

Science News Letter, April 18, 1942

SOIL SCIENCE

PRELIMINARY COLOR STANDARDS AND COLOR NAMES FOR SOILS—T. D. Rice, Dorothy Nickerson, A. M. O'Neal and James Thorp—*Govt. Print. Off.,* 12 p., soil color name charts, $3. A worthwhile effort to introduce a greater degree of exactness into the classification of soils by color.

Science News Letter, April 18, 1942

SPORTS

COMPETITIVE SWIMMING AND DIVING —David A. Armbruster—*Mosby,* 301 p., illus., $3.25. By the associate professor of physical education and head swimming coach at the University of Iowa. Details of the various crawl strokes and the breast stroke, and competitive diving, with useful chapters on conditioning and training are given. The diagrams illustrating each chapter are amazingly good.

Science News Letter, April 18, 1942

CHEMISTRY

CHEMICAL SOLUTIONS, Reagents Useful to the Chemist, Biologist, and Bacteriologist—Frank Welcher—*Van Nostrand,* 404 p., $4.75. The reagents are listed alphabetically; use, preparation and other data are given.

Science News Letter, April 18, 1942